

## SERVICING AND REPAIRING VEHICLE ENGINE COMPONENTS

**UNIT CODE: ENG/AUT/CR/2/6**

### **Relationship to Occupational Standards**

*This unit addresses the unit of competency and meets the requirements specified by the Occupational Standards: Service and repair vehicle engine components*

**Duration of Unit:** 170 hours

### **Unit Description:**

This unit describes the competencies required in service and repair vehicle engine components. It involves troubleshooting and servicing vehicle engine components, performing vehicle engine overhaul, servicing vehicle engine cooling system, servicing vehicle engine exhaust system and lubricating vehicle engine system

### **Summary of Learning Outcomes:**

1. Troubleshoot and service vehicle engine components
2. Perform vehicle engine overhaul
3. Service vehicle engine cooling system
4. Service vehicle engine exhaust system
5. Lubricate vehicle engine system

### **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Troubleshoot vehicle engine components conditions	<ul style="list-style-type: none"><li><input type="checkbox"/> Use of Personal protective equipment (PPE)</li><li><input type="checkbox"/> Health and safety regulations</li><li><input type="checkbox"/> Engine removal</li><li><input type="checkbox"/> Dismantling of engine</li><li><input type="checkbox"/> Engine parts</li><li><input type="checkbox"/> Servicing engine parts</li><li><input type="checkbox"/> Reassembling of engine parts</li><li><input type="checkbox"/> Engine fitting</li><li><input type="checkbox"/> Re-installation checks</li><li><input type="checkbox"/></li></ul>	<ul style="list-style-type: none"><li>• Practical</li><li>• Oral questioning</li><li>• Written test</li></ul>

2. Perform vehicle engine overhaul	<input type="checkbox"/> Replacement of Engine oil seals <input type="checkbox"/> Replacement of Engine oil rings/ piston gudgeon pin <input type="checkbox"/> Replacement of Timing belts/chains <input type="checkbox"/> Replacement of Engine bearings <input type="checkbox"/> Replacement of Engine pulleys <input type="checkbox"/> Replacement of Engine V-belts <input type="checkbox"/> Replacement of Engine gaskets <input type="checkbox"/> Servicing Engine blocks <input type="checkbox"/> Replacement of Water/oil pump <input type="checkbox"/> Adjustment of Tappet clearance <input type="checkbox"/> Replacement of Engine <input type="checkbox"/>	<ul style="list-style-type: none"> <li>• Practical</li> <li>• Observation</li> <li>• Written tests</li> <li>• Writing reports</li> </ul>
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<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
	camshaft <input type="checkbox"/> Grinding Valve seats <input type="checkbox"/> Replacement of Valve guides <input type="checkbox"/> Replacement of Oil sump/strainer/PCV <input type="checkbox"/> Replacement of Engine mountings <input type="checkbox"/> Performing Engine tune up	

<p>3. Service vehicle engine cooling system</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Checking and testing Radiator cap</li> <li><input type="checkbox"/> Checking and testing cooling radiator</li> <li><input type="checkbox"/> Checking and testing cooling system hoses</li> <li><input type="checkbox"/> Checking and testing thermostat operations</li> <li><input type="checkbox"/> Checking and testing thermistor switches/ sensors</li> <li><input type="checkbox"/> Checking and testing water pump</li> <li><input type="checkbox"/> Checking and testing cooling fan operation</li> <li><input type="checkbox"/> Checking and testing cooling system bleeding cooling system</li> <li><input type="checkbox"/> reading vehicle engine coolant</li> <li><input type="checkbox"/></li> </ul>	<ul style="list-style-type: none"> <li>• Practical</li> <li>• Oral</li> <li>• Short tests</li> <li>• Learner portfolio of evidence.</li> </ul>
<p><b>Learning Outcome</b></p>	<p><b>Content</b></p>	<p><b>Suggested Assessment Methods</b></p>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> replenishing coolant</li> </ul>	
<p>4. Service vehicle engine exhaust system</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Checking leakage</li> <li><input type="checkbox"/> Checking blockage</li> <li><input type="checkbox"/> Checking and testing catalytic converter/ particulate filters</li> <li><input type="checkbox"/> Repairing exhaust system leaks</li> <li><input type="checkbox"/> Installing and mounting exhaust system</li> <li><input type="checkbox"/> Checking and testing oxygen sensor</li> </ul>	<ul style="list-style-type: none"> <li>• Practical</li> <li>• Oral</li> <li>• Short tests</li> <li>• Learner portfolio of evidence.</li> </ul>

5. lubricate vehicle engine system	<input type="checkbox"/> Draining and replacing engine oil <input type="checkbox"/> Replacing engine transmission and hydraulic filters Greasing light vehicle components <input type="checkbox"/> Greasing heavy commercial vehicle components <input type="checkbox"/> Greasing Heavy machinery <input type="checkbox"/> Reading Lubricants	<ul style="list-style-type: none"> <li>• Practical</li> <li>• Oral</li> <li>• Short tests</li> <li>• Learner portfolio of evidence.</li> </ul>
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### Suggested Methods of Delivery

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised activities and projects in a workshop;
- The delivery may also be supplemented and enhanced by the following, if the opportunity allows:
- Visiting lecturer/trainer from the motor vehicle service and repair sector;
- Industrial visits.

### Recommended Resources

#### Tools

- Comprehensive set of hand tools for the service and repair of motor vehicle Engines.

#### Equipment

- Engine instructional models;
- A fully equipped motor vehicle maintenance workshop;
- Fully functional vehicle(s);
- Functional engines;
- Engine components;
- Vehicle lift/inspection pit;
- Specialist tools and diagnostic equipment appropriate for the different makes and types of vehicle engines that are being maintained;
- Internet access to manufacturers' technical information/data
- Torque setting tools;
- Personal protective equipment (PPE) and suitable coverings to protect vehicles;
- Vehicle protective coverings;
- Facilities for the disposal of waste oil and used parts;
- Customer database and systems for recording maintenance records.

#### Materials and supplies

- Digital instructional material including DVDs and CDs;
- Consumables for service and repair of vehicle engines including:
  - Engine lubricants;
  - Sealants, oil seals and gaskets;
  - Cleaning materials;
  - Hand cleaner;
  - Cotton waste for cleaning

**Reference materials**

- Manufacturers service manuals for the vehicles that are being serviced;
- Appropriate automotive engineering text books available on numerous websites e.g.

**SERVICING VEHICLE FUEL SYSTEM**

**UNIT CODE: ENG/CU/AUT/CR/3/6**

**Relationship to Occupational Standards**

*This unit addresses the unit of competency and meets the requirements specified by the Occupational Standards: **Service vehicle fuel system***

**Duration of Unit:** 150hours

**Unit Description:**

This unit describes the competencies required to service vehicle fuel system. It involves servicing fuel components, replacing petrol fuel pump and diesel injector pump, performing injector timing, testing injectors for pressure and voltage.

**Summary of Learning Outcomes:**

By the end of the unit, the trainee should be able to:

1. Service fuel components e.g. injectors, tank
2. Replace petrol fuel pump
3. Replace diesel injector pump, rail, pipes and nozzles.
4. Perform injector pump timing
5. Test fuel injectors for injection pressure and voltage

**Learning Outcomes, Content and Suggested Assessment Methods**

Learning Outcome	Content	Suggested Assessment Methods
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